

We claim

The invention relates to a process for a fully closed, zero discharge, clean oxidizing pulping technology and process. The character of the invention is that materials of the cleaning pulping process and the preparation method are non-wood and wood. Preparation of the pulp can be finished according to undermentioned processes.

(A) Pretreatment of raw materials.

(B) Above materials are dipped in the active oxygen A and cellulose preserver that is made of metal ions and metal ion ligands.

(C) The dipped oxidizing materials are grinded in turn by the active oxygen A and the active oxygen B.

(D) Concentrate and beating.

In accordance with the present invention, the active oxygen A is selected from O_2 , H_2O_2 , and one or two free radicals generated from O_2 , H_2O_2 . The active oxygen B is selected from O_3 , 1O_2 (singlet oxygen), $O_2^-/HOO \cdot$ (superoxide anion radical) and one or multi-kinds of free radicals generated from O_3 , 1O_2 , $O_2^-/HOO \cdot$ in water in which organic solvent exists.

2. In accordance with the method of claim 1, the character of the invention is that the non-wood materials such as full cotton stalk includes cotton bast, cotton stem, cotton stalk root and full cotton holocellulose, cellulose and hemicellulose of valvular cotton, cotton short linter, cotton dregs, cottonseed, a kind of lignin or two or multi-kinds of their compounds. The described wood fiber includes soft wood and hard wood such as Masson pine, longitudinal white pine, David poplar, fast-growing poplar,

birch and so on.

3. In accordance with the method of claim 1, the metal ions are selected from Mg^{2+} , Fe^{2+} , Mn^{2+} , Cu^{2+} , Al^{3+} , Zn^{2+} , Si^{2+} and two or multi-kinds of their compounds. The metallic ion ligands include DMD, DTPA, EDTA, alkyl-sulfonic acid sodium, poly-oxyethyl-enabkylether and two or multi-kinds of their compounds.

4. In accordance with the method of claim 1, dosage of the metal ions is between 1-1000ppm.

5. In accordance with the method of claim 1, the oxidizing dipping treatment is carried out in acidic condition whose pH is between 1-4.

6. In accordance with the method of claim 1, the best pH of the oxidizing dipping treatment is between 1.5-2.5.

7. In accordance with the method of claim 1, the grinding treatment is carried out in acidic condition whose pH is between 1-4,

8. In accordance with the method of claim 1, the best pH of the grinding treatment is between 2.5-3.8.

9. In accordance with the method of claim 1, the concentration of active oxygen A in above materials is 0.01-2.0wt%, the concentration of active oxygen B in above materials is 0.1-50umol/L.

10. In accordance with the method of claim 1, the method has follow characters and advantages:

(A) In grinding process, the active oxygen is dropped into the disc refiner, in which heat energy is generated through the rotation of the disc, and the energy is transferred into the materials for reaction, then the fiber is separated from the lamella.

(B) With cooperation of A and B, the chromophoric group (α , β -aldehyde or

ketone group) in the lignin is transformed into non-color group (the carboxylic acid or binary acid).

(C) Self-cycling: All water in the process from the pretreatment of raw materials till the delivery of it to the oxidation reactor is divided into two parts to accomplish the self-cycling in the process. One is the water from the process of materials cleaning pretreatment. It is purified by centrifugal cleaning and the solid sediments in it are taken away. The pulps are sent to the common beating process. Water generated in the process is cycled into purification pool. 0.1%-0.15% ozonizer and acticarbon nutsch filter are installed in the purification pool to decolor the water. The water contains oxygen free radical and it is pumped into the cycling water system. The other is the water from the oxidizing process. After cleaned with centrifugal cleaner and then is concentrated with common decker, the pulp is sent to the tank for papermaking. The produced water is filtrated and placed in the water-purifying tank for self-cycling. The purified water is pumped into materials cleaning system, oxygen dipping system, oxygen grinding system and filtrating system for recycling use.

11. The pulp obtained from any process described in claim 1 to 10.